

## CLAIMS

What is claimed is:

1. An apparatus of generating an output code stream, comprising:
  - a first bit repeater to repeat an incoming code stream;
  - a second bit repeater to repeat a first parity bit stream of the incoming code stream;
  - a third bit repeater to repeat a second parity bit stream of the incoming code stream;
  - a multiplexer coupled to the first, second, and third bit repeaters to combine the repeated incoming code stream, the repeated first parity bit stream, and the repeated second parity bit stream to generate the output code stream that is optimally-repeated from the incoming code stream and its parity bit streams.
2. The apparatus of claim 1, further comprising
  - a first parity generator to generate the first parity bit stream;
  - an interleaving module to interleave the incoming code stream;
  - a second parity generator coupled to the interleaving module to generate the second parity bit stream based on the interleaved incoming code stream.
3. The apparatus of claim 2, wherein each of the first and second parity generator is a recursive systematic convolutional code encoder.
4. The apparatus of claim 1, further comprising a control module coupled to the first, second, and third repeaters to provide each of the repeaters with an individually set repeating rate.

5. The apparatus of claim 4, wherein the repeating rate of each of the repeaters is set by the control module such that the transmission rate of the output code stream matches a transmission rate of a communication channel that transmits the output code stream to a decoder while the output code stream is optimally-repeated.

6. A method of generating an optimally-repeated output code from an incoming code, comprising

repeating the incoming code, a first parity bit stream of the incoming code, and a second parity bit stream of the incoming code individually and separately from each other such that optimal performance is obtained when the repeated incoming code, the repeated first parity bit stream, and the repeated second parity bit stream are combined to generate the output code;

combining the repeated incoming code, the repeated first parity bit stream, and the repeated second parity bit stream to generate the output code.

7. The method of claim 6, further comprising generating the first parity bit stream by a first recursive convolutional code encoder;

interleaving the incoming code; and generating the second parity bit stream from the interleaved incoming code by a second recursive convolutional code encoder.

8. The method of claim 6, further comprising determining the repeating rate for each of the incoming code, the first parity bit stream, and the second parity bit stream individually and separately

such that the transmission rate of the output code stream matches a transmission rate of a communication channel that transmits the output code stream to a decoder while the output code stream is optimally-repeated.